# Riccardo Ceccarani

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## EDUCATION

**Università Degli Studi di Milano** **Present**

***Master in Computer Science* | LM-18 -** *in progress*

- **Relevant Coursework:** Distributed and Pervasive Systems,Artificial Intelligence,New Generation Data Models and DBMSs,Parallel and Distributed Algorithms, Software Development in Complex Working Groups

**Università Degli Studi di Camerino**

***Laurea Triennale in Informatica*| L-31 - 103**

- **Relevant Coursework:**Algorithms and Data Structures, Advanced Programming Paradigms, Software Engineering, Database Systems, Operating Systems,Probability and Statistics

## TECHNICAL SKILLS

**Languages:** Java, Python(Pandas, NumPy,PyTorch, Scikit-learn), JavaScript, TypeScript, Cypher (Neo4j), SQL
**AI & Agentic Frameworks:** LangGraph, LangChain
**Distributed Systems & Backend:** Spring Boot, gRPC, MQTT (Mosquitto), Node.js, Prisma ORM, REST APIs
**Databases**: Neo4j (Graph DB), MongoDB, Firebase, PostgreSQL, SQLite
**Tools & Frontend:** Docker**,** Git, React, Streamlit, React Native, Remix, Shopify Polaris

## RELEVANT EXPERIENCE

**EveryWare Lab - CS research laboratory |** *Milano, MSc Thesis Intern* **Sept. 2025 - Present**

- **Leading the development** of a Natural Language Interface (NLI) leveraging **LangChain** for the EU-funded SERENADE project, focusing on early detection of cognitive decline via smart home sensors.
- **Architecting the system's core orchestration** using **LangGraph** to implement a **multi-agent approach**, enabling robust state management across diverse health domains and sensor data streams.
- **Collaborating** with a multidisciplinary team of researchers and clinicians to translate complex medical requirements into technical AI specifications and **Explainable AI (XAI)** metrics.

**Università degli Studi di Camerino** | *Camerino, BSc Thesis Research Intern* **Apr-June. 2023**

- Developed a **Process Mining clustering methodology** for large-scale event logs, utilizing N-grams for trace representation and K-Means for unsupervised learning.
- Engineered a "repetition-aware" distance metric (*Repeating distance*) to effectively handle loops and recurring activities, significantly improving pattern detection accuracy compared to the standard Jaccard distance.
- Led the design and implementation of the distance matrix generation module, managing the technical logic and ensuring seamless integration within the team's software framework.
- Optimized and validated clustering performance using the Silhouette index, refining parameters to maximize data cohesion and cluster separation.

## PROJECTS

**Natural Language Interface for Cognitive Decline Detection |** *MSc Thesis* **In progress**

- **Developed a full-stack AI solution** leveraging Python and LangGraph/LangChain, empowering non-technical users to extract insights from sensor data via natural language.
- **Engineered high-performance analysis pipelines**, replacing manual data review with automated agents that reduce time-to-insight for clinicians.
- Implemented containerized execution environment (Docker) to safely execute **LLM-generated analysis code**, mitigating injection risks and ensuring stability in production-like settings
- **Integrated Explainable AI (XAI)** layers, enabling transparent and trustworthy metrics for healthcare decision-making.

**Distributed Energy Supply Management |** *Academic Projects* **May. 2025**

- Engineered a distributed system simulation for energy networks using **Java/Spring Boot, gRPC, and MQTT (Mosquitto)**.
- Implemented the **Chang-Roberts Ring Algorithm** for leader election among thermal plants and built custom synchronization primitives (locks, semaphores) from scratch.
- Designed a multi-threaded architecture to handle concurrent gRPC server threads, MQTT subscribers, and sliding-window sensor data processing.

**Snap – Shopify Short Link Analytics |** *Personal Project* **July 2025**

- Developed a full-stack Shopify app using **Remix, React 18, and Prisma** to track customer conversion funnels through trackable short links.
- Integrated **Shopify Web Pixels** to capture real-time events (add-to-cart, checkout completion) and visualized metrics using **Recharts**.
- Implemented unique link generation and bot detection, providing merchants with deep insights into revenue and device-specific behavior.

**NoSQL Credit Card Fraud Detection|** *Academic Projects* **April. 2025**

- Built a graph-based fraud detection system in **Neo4j** and **Python**, analyzing datasets of up to 4 million transactions
- Optimized **Cypher** queries using **APOC procedures** and batch processing, achieving sub-2 second response times for complex pattern matching.

## LEADERSHIP EXPERIENCE

**Technical Project Ownership**

Proven ability to manage technical tasks in team settings, from designing multi-agent systems at **EveryWare Lab** to developing core modules for a **3-person group project** (BSc Thesis).

- **Communication:** Acting as a link between researchers and developers, turning clinical needs into clear technical tasks.
- **Coordination:** Managed the development and integration of complex algorithms, ensuring that individual modules worked together and met project deadlines.